

EVIDENCE ON E-PRESCRIBING SYSTEMS WORLDWIDE. FIRST ROMANIAN RESULTS.

DOINA DRĂGĂNESCU¹, DUMITRU LUPULEASA²,
ION-BOGDAN DUMITRESCU¹, CRISTINA ELENA DINU PÂRVU^{3*},
DRAGOȘ FLORIAN CIOLAN⁴

*“Carol Davila” University of Medicine and Pharmacy, Faculty of
Pharmacy, Bucharest, Romania*

¹*Pharmaceutical Physics and Informatics Department, “Carol Davila”
University of Medicine and Pharmacy, Faculty of Pharmacy, Str. Traian
Vuia 6, Bucharest, Romania*

²*Romanian College of Pharmacists, Str. Viitorului 4, Bucharest, Romania*

³*Physical Chemistry and Colloids Department, “Carol Davila”
University of Medicine and Pharmacy, Faculty of Pharmacy, Str. Traian
Vuia 6, Bucharest, Romania*

⁴*Pharmaceutical Chemistry Department, “Carol Davila” University of
Medicine and Pharmacy, Faculty of Pharmacy, Str. Traian Vuia 6,
Bucharest, Romania*

**corresponding author: ecristinaparvu@yahoo.com*

Abstract

The use of e-prescribing systems is a result of the development of information and technology systems and awareness of the direct and indirect benefits that may result for the patients, the health systems and the medical professionals involved. E-prescribing is the newest resource for improving the quality and efficiency of care and saving life.

The electronic prescribing system coupled with the development and use of the electronic health record in a unique system resulting in achieving a common goal of all health systems, namely, a decrease in medication errors. As a result, both European Union and the United States of America have specific regulations for the introduction and the use of these systems in clinical practice by physicians, pharmacists and health insurance houses.

In Romania, the electronic system was implemented as a pilot project in 2012, and will be mandatory for all the components of the health system (hospitals, practices, pharmacies) starting with January 1st, 2013. The Romanian national system SIUI-SIPE (*Sistem Informatic Unic Integrat - Sistem Informatic de Prescriptie Electronica*), which is validated by the Romanian Health Insurance House, has the possibility to manage online and offline prescriptions, from private practices and hospitals.

Rezumat

Utilizarea sistemelor electronice pentru prescrierea și eliberarea medicamentelor este rezultatul dezvoltării tehnologiei informației și comunicațiilor și a conștientizării beneficiilor directe și indirecte pe care le poate determina pentru pacienți, sistemul de sănătate și pentru personalul medical implicat. Prescripția electronică este cel mai nou mod pentru îmbunătățirea calității și eficienței asistenței medicale și în salvarea vieții pacienților.

Sistemul de prescriere electronică, dublat de realizarea și utilizarea dosarului electronic al pacientului într-un sistem informatic unic are ca rezultat atingerea unui deziderat al tuturor sistemelor de sănătate și anume, scăderea ratei de erori de medicație. Ca urmare, atât în Uniunea Europeană, cât și în Statele Unite ale Americii există reglementări specifice pentru introducerea și utilizarea în practica curentă a medicilor prescriptori, farmaciștilor și a caselor de asigurări de sănătate.

În România, sistemul electronic a fost implementat ca proiect pilot în 2012, fiind obligatoriu pentru toate componentele sistemului de sănătate (spitale, farmacii, cabinete medicale particulare, etc.), începând cu 1 ianuarie 2013. Sistemul SIUI- SIPE (Sistem Informatic Unic Integrat – Sistem Informatic de Prescripție Electronică), care este validat de către Casa Națională de Asigurări de Sănătate, are posibilitatea de a gestiona rețetele prescrise *online* cât și *offline*.

Keywords: E-prescription, medication errors, Romania

Introduction

Electronic prescription or e-prescribing (e-Rx) is the computer-based electronic process of generating, transmitting and filling of a medical prescription, replacing the paper based and faxed prescriptions.

E-prescription is meant to reduce the risks associated with traditional prescription script writing. The system is rapidly becoming a standard of practice in the United States with more than one-third of private practice prescribers actively e-prescribing [1].

E-prescribing empowers more informed decision making physicians and pharmacists, because of the existence of patient formulary, eligibility and medication history information available at the point that prescribing decisions are made.

System implementation

The implementation of the electronic prescribing system was possible in those countries with financial resources and where all the collaborators involved agreed upon about the adoption and use of the e-prescribing.

In the United States of America there are two government programs – Medicare Improvements for Patients and Providers Act (MIPPA) and Health Information Technology for Economic and Clinical Health (HITECH) – which currently allow healthcare professionals to receive financial incentives through the adoption and use of e-prescribing technology.

Accordingly, the aims of the e-prescribing system are the following:

- to generate a complete active medication list and integrate drug-drug interaction and drug allergy checks;

- selection of medication, transmitting, printing prescriptions, conducting all safety checks using integrated decision support systems;
- providing information on patient eligibility, and authorization requirements received electronically from the patient's drug plan;
- viewing details of a medication, removing a medication from the active medication list, changing dose;
- prescribing or adding new medication and selecting the pharmacy where the prescription will be filled;
- connection with various databases, with pharmacies and pharmacy benefit manager systems;
- education capabilities (for patients).

The system has common components, as follows:

- prescribers;
- transaction hub;
- pharmacies that implemented electronic prescribing software;
- pharmacy Benefit Manager (PBM).

The e-prescribing process starts with the patient visit to the physician who collects the patient's consent, demographic and personal information. Through its connectivity with the network, the patient is uniquely identified in a master patient index maintained by an e-prescribing network. The request for patient information is sent to connect payers, PBMs and pharmacies. The payer/PBM returns the prescription benefit, formulary and medication history information to the physician's e-prescribing application [2].

The physician then validates the information with the patient, reviews all the specific data, selects the medication therapy (the most appropriate for the specific condition of the patient), selects a pharmacy for dispensing and generates the e-prescription. The prescriber can modify the prescription depending on any drug-drug or drug-allergy alerts. At the end of the process the prescription is then electronically sent to the pharmacy system.

The electronic connectivity is bi-directional, between the physician's system and the pharmacy system. It also allows the prescription renewal process to be automated, which saves time in the practice.

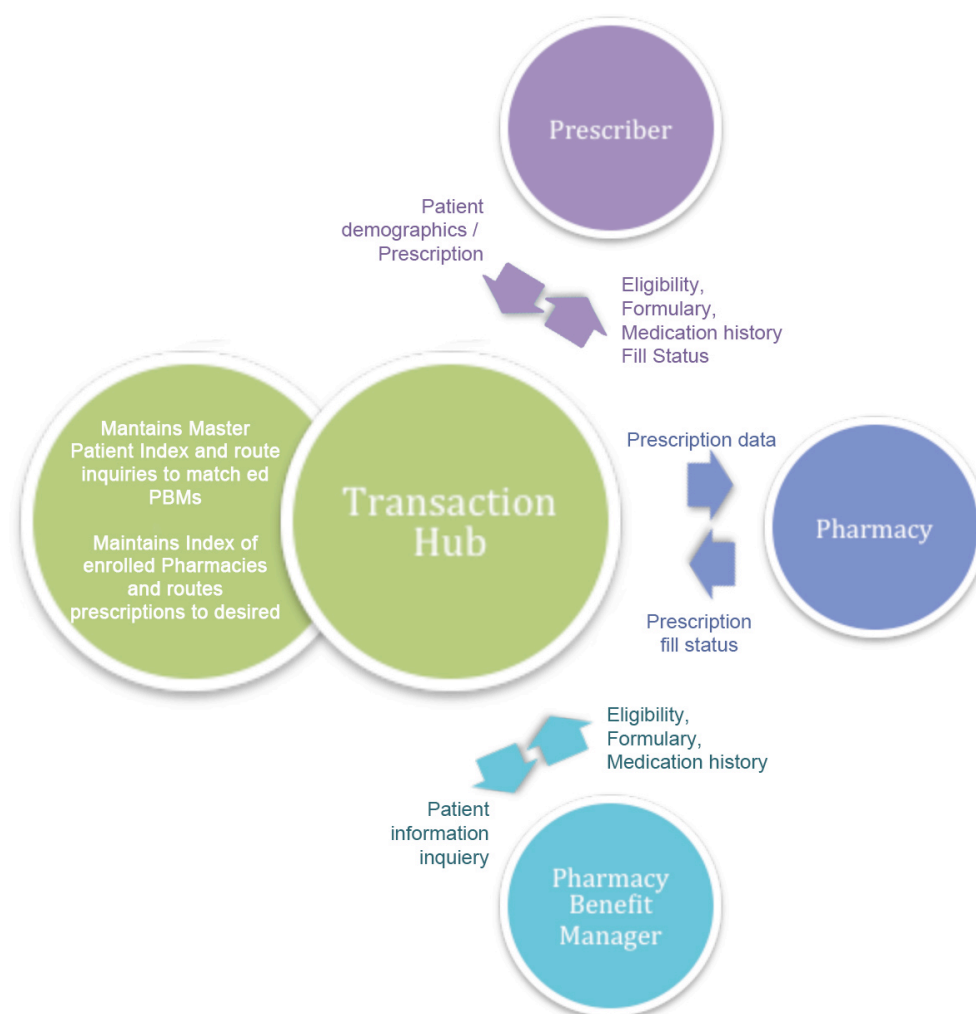


Figure 1
The e-prescribing system components [10]

Benefits of e-prescribing

E-prescribing has the potential to reduce the adverse drug events, in a country where more than 1.5 million preventable adverse drug events take place every year, in conformity with the reports of the US Institute of Medicine [3].

The drug costs are reduced through increased formulary compliance, use of generics and other low cost alternative medications.

It enables payers to communicate information to physicians and to patients that will engage them in their care and medication adherence education.

It saves time in practice and pharmacy (time spent managing prescriptions in case there are errors, or unreadable prescription or renewals). Nevertheless, pharmacists took action with an intervention rate of approximately 4% (102 times) after reviewing 2690 electronic prescription orders [2].

It improves consumer convenience and support a better medication adherence (11% increases in prescription reaching the pharmacy in the Walgreens Pharmacy Chain) [4,5].

One of the main impediments remains the lack of integration among information systems used by physicians, pharmacies, laboratories, hospitals, payers and others responsible for patient care in a given community [12].

Statistics for the United States (using Surescripts, a company which operates the largest e-prescribing network in USA)

More than 75% of e-prescribing is taking place in the context of full EHRs (electronic health record). At the end of 2010, over 230,000 physicians and other clinicians or almost one-third of practicing physicians are actively prescribing, more than 90 percent of pharmacies are electronically enabled, from the 10 states that are connected to the e-prescription system through Medicaid (the US health program for people and families with low incomes and resources) [6].

The remaining interruptions in the adoption process include about 25% of the independent pharmacies.

One of the aims of the European Union (EU) is to implement an electronic healthcare system and the possibility for the EU citizens of using e-prescription anywhere within the union. The leading countries are those from the Scandinavian Peninsula (Denmark, Sweden), the Netherlands, Estonia, Iceland, Greece, England and Scotland.

E-prescribing in Romania

The pilot project started on July 1st 2012, and the number of electronic prescriptions increased every month, as it is presented for the first four months of implementation (data courtesy to the Romanian Health Insurance House):

- July 2012: 102.604 prescribed / 67.792 delivered
- August 2012: 428.671 prescribed / 342.710 delivered
- September 2012: 1.230.519 prescribed / 1.025.921 delivered
- October 2012: 2.131.766 prescribed / 1.791.502 delivered

After the 1st of January 2013 the system will be mandatory for all the prescribers and all pharmacies in all the regions of Romania.

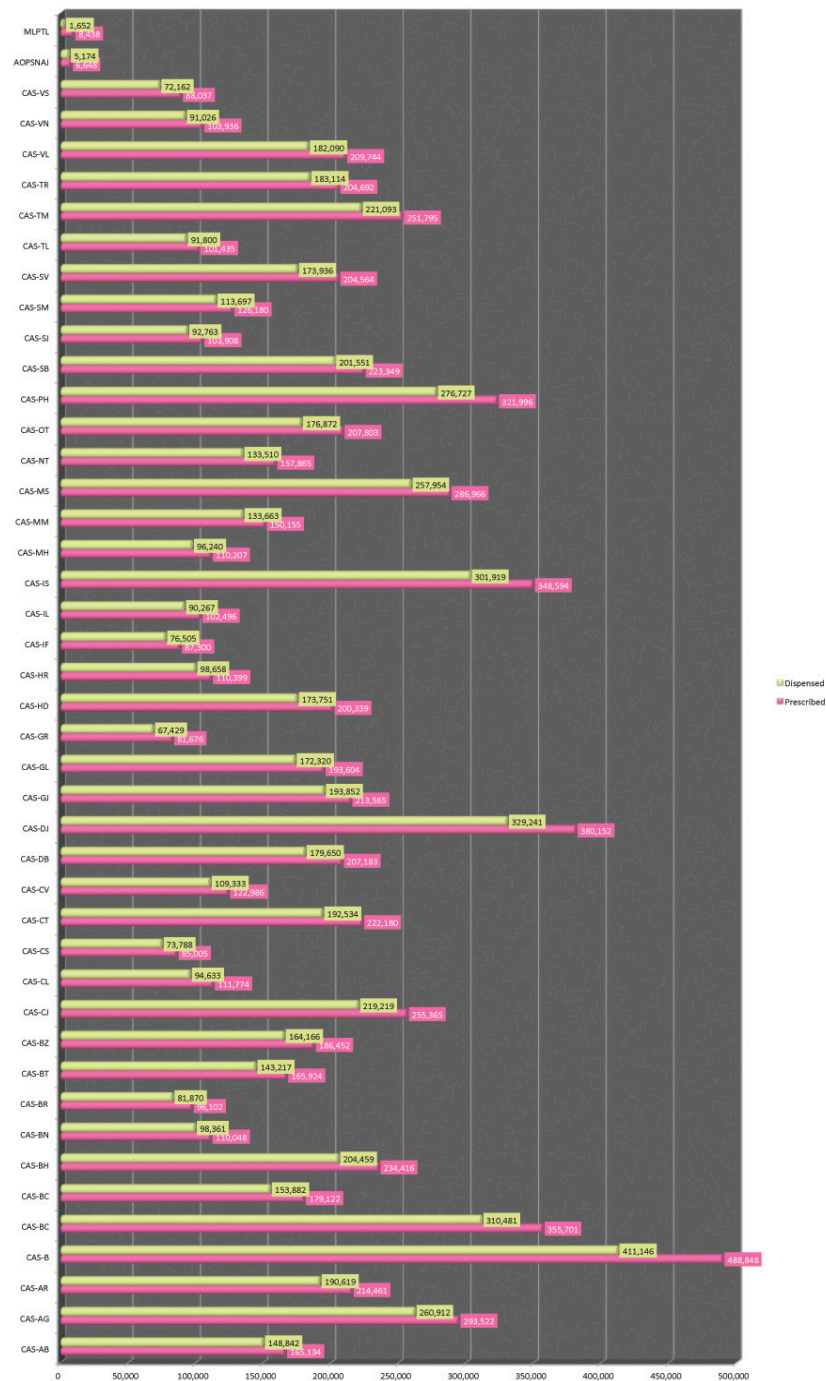


Figure 2

Regional repartition of the prescribed and the filled e-prescriptions in Romania. CAS-AB to CAS-VS represent the regional Health Insurance Houses in Romania and AOPSNJ represents The Romanian Army Health Insurance House

The types of prescriptions that were analysed were mainly online, but also offline (only for justified situations) with 2 components: prescription component and releasing component, both with bare-codes (two dimensional matrix barcodes). The minimum technical conditions required were: Internet connexion, download speed higher than 2 Mbps and upload speed higher than 1 Mbps, electronic signature. The software is free of charge and it is provided by the Romanian Health Insurance House.

The aims of using the electronic prescription system were of a large complexity: generally, to clarify the responsibilities for the prescriber, pharmacist and Health Insurance House, to eliminate all the situations which are not strictly defined; monitoring the financial compensation for drugs, a better management of funds, in order to avoid errors in prescribing and delivering drugs, errors of overdosing; monitoring of the quality of the prescribing system, overlays, off label prescriptions, mistakes in indications, dosages, etc. Furthermore, for the pharmacists, there is more time for delivering the counseling to patients regarding the administration, regarding a specific diet, or other products (*i.e.* dietary supplements) which can be helpful in his particular condition [7,8,13].

In conformity with the report from the Romanian Health Insurance House during the first month after the implementation of the system in Romania, there were 8.080.065 valid electronic prescriptions, 7.930.412 online prescriptions, 138.663 offline prescriptions (from medical offices), 10.990 offline prescriptions (prescribed at the patients home), with 15.761 users of the system.

Table I

Expected results in using electronic prescription

Expected results	
For pharmacists	The automatic data retrieving without errors and without further appeal for payment, short time to release the prescription, easy report system, online validation for payment online prescriptions.
For physicians	No obligation to go monthly to the insurance houses to buy paper prescriptions, the system will alert about the drug doses, drug interactions, contraindications etc., in the context of registered diagnoses, and other previously dispensed drugs on the same pathology. The goals are to avoid overdoses, to recommend drugs for the appropriate age of the patient, for groups or for pathologies for which there are no indications or for which the drugs are not included in the commonly used therapeutic protocols.
For patients	Shorter time for drugs delivery in pharmacy, fractional release of drugs, the possibility of taking the prescribed medication anywhere in the country
For the national health system	Real time monitoring of drugs used, effective mechanisms for fraud preventing

The practical issues, solved in the first six months since the first launch of the system were: error messages for online prescriptions, variation of prescriptions number in same pharmacies or errors due to electrical black-out before saving the prescriptions [9].

Conclusions

The electronic prescription system proved its qualities and performances on all the following aspects: it clarifies the responsibilities of the prescriber, pharmacist and Health Insurance House, monitoring the financial compensation for drugs, a better management of funds, in order to avoid errors in prescribing and delivering drugs, errors of overdosing, mistakes in indications. Furthermore, for the pharmacists, there is more time for counseling the patients regarding drug administration, appropriate diet adequate for specific pathologies and drug efficacy. E-prescriptions will facilitate the exchange of all medical and pharmacological information, will patients' safety, as well as their quality of life.

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